

WHAT IS CLAIMED IS:

1. A battery structure for an electric vehicle where a plurality of pillar shaped battery cells are accommodated in a battery case and
5 the battery cells are electrically connected, comprising:

an upper covering member, having a plurality of holding ribs for dividing the battery case into a plurality of partition rooms in a longitudinal direction and for holding the battery cells in a horizontal state, and in which a plurality of ventilating holes for discharging
10 cooling air from the battery case are formed;

a middle covering member, having a plurality of holding ribs for dividing the battery case into a plurality of partition rooms in a longitudinal direction and for holding the battery cells in a horizontal state;

15 a lower covering member, having a plurality of holding ribs for dividing the battery case into a plurality of partition rooms in a longitudinal direction and for holding the battery cells in a horizontal state, and in which a plurality of ventilating holes, whose total aperture area is larger than a total aperture area of the ventilating
20 holes formed in the upper covering member, for introducing the cooling air into the battery case are formed; and

two side covering members for covering exposed side surfaces of the battery cells which are held in the horizontal state.

25 2. A battery structure for an electric vehicle according to

claim 1, wherein an aperture area of each of the ventilating holes formed in the upper covering member is smaller than that of each of the ventilating holes formed in the lower covering member, and the number of the ventilating holes formed in the upper covering member is larger
5 than that of the ventilating holes formed in the lower covering member.

3. A battery structure for an electric vehicle according to claim 1, wherein circular arc shaped holding end surfaces, on which groove portions are formed in a circumferential direction, for holding
10 the battery cells, are formed in the holding ribs, and adhesives are filled up in the groove portions.

4. A battery structure for an electric vehicle according to claim 1, wherein a tunnel part which penetrates through the upper
15 covering member in a longitudinal direction and which accommodates lead wires for internal wiring is formed in the upper covering member, and the lead wires are not exposed to an exterior of the battery case.

5. A battery structure for an electric vehicle according to
20 claim 1, wherein the middle covering member has strengthening ribs in a longitudinal direction for strengthening the holding ribs of the middle covering member.

6. A battery structure for an electric vehicle according to
25 claim 1, wherein a plurality of foot portions which are provided so

as to project out from a bottom face of the lower covering are formed, and the bottom face is separated from a mounting floor for the battery case.

5 7. A battery structure for an electric vehicle according to claim 1, wherein the exposed side surfaces of the battery cells are connected with a connecting member for connecting battery cells electrically in series.

10 8. A battery structure for an electric vehicle according to claim 1, wherein a plurality of fuse holding ribs for holding a fuse from a bottom side are formed so as to project toward the fuse on an upper portion of one of the side covering members, and the fuse is held and fixed in a vertical direction by the fuse holding ribs and a fuse
15 cover on which a plurality of fuse holding ribs for holding the fuse from an upper side are formed so as to project inside the fuse cover.

 9. A battery structure for an electric vehicle according to claim 1, wherein an accommodating portion for accommodating a battery
20 cell control unit for controlling the battery cells is disposed at an upper portion of another of the side covering members, a plurality of unit holding ribs for holding the battery cell control unit from a bottom side are formed so as to project toward the battery cell control unit, and the battery cell control unit is held and fixed in a vertical
25 direction by the unit holding ribs and a battery cell control unit cover

on which a plurality of unit holding ribs for holding the battery cell control unit from an upper side are formed so as to project inside the battery cell control unit cover.

5 10. A battery structure for an electric vehicle according to claim 8, wherein external output terminals are formed vertically via an insulating material so as to stride over the fuse on the upper portion of one of the side covering members.

10 11. A battery structure for an electric vehicle according to claim 9, wherein the accommodating portion is mounted on the upper covering unit.

12. A battery structure for an electric vehicle according to
15 claim 1, wherein the battery cell is covered with an outer tube made of resin material having electrical insulation.

13. A battery structure for an electric vehicle according to
claim 1, wherein the battery case accommodates eight battery cells in
20 total in four rows along a horizontal direction and in two rows along a vertical direction.

14. A battery structure for an electric vehicle according to
claim 1, wherein each of joining end faces of the upper covering member,
25 the middle covering member and the lower covering member has a straight

scarf joint structure.

15. A battery structure for an electric vehicle according to claim 2, wherein the aperture area of each of the ventilating holes
5 formed in the upper covering member is $1/2$ of that of each of the ventilating holes formed in the lower covering member

16. A battery structure for an electric vehicle according to claim 3, wherein the holding ribs are at least formed at positions where
10 both end portions of electrode groups of the battery cells are held.

17. A battery structure for an electric vehicle according to claim 3, wherein one of the holding ribs is formed at a central position,
in a longitudinal direction, of the battery cells.
15

18. A battery structure for an electric vehicle according to claim 4, wherein the tunnel part is formed at an inside of the upper
covering member.

20 19. A battery module having the battery structure for an electric vehicle according to claim 1.

20. A battery module having the battery structure for an electric vehicle according to claim 2.

25